

What is claimed is:

1. A joint for a duplex pipe including an outer pipe for passing a first fluid, an inner pipe disposed inside of the outer pipe, the inner pipe for passing a second fluid, and a rib for connecting the outer pipe with the inner pipe, wherein the outer pipe is eliminated at an end portion to expose the inner pipe, the joint comprising:

a main body disposed at the end portion of the outer pipe to cover the inner pipe exposed, the main body defining a passage for passing the first fluid flowing inside the outer pipe, the main body defining a first opening communicated with the passage, and a second opening penetrated by the inner pipe exposed;

a first connecting portion defining a first through hole communicated with a first outlet pipe;

a second connecting portion defining a second through hole for connecting the inner pipe with a second outlet pipe; and

a connecting pipe for guiding the first fluid to the first connecting portion, one end of the connecting pipe disposed at the first opening, the other end of the connecting pipe disposed at the first through-hole of the first connecting portion;

wherein the first opening is formed at a predetermined position in response to disposed conditions of the connecting pipe to utilize the main body in common.

2. The joint according to claim 1, wherein the second connecting portion is integrally formed with the inner pipe, and has a joining portion for connecting the second connecting portion to the second outer pipe.

3. The joint according to claim 1, wherein the main body has a wall defining the first opening.

4. The joint according to claim 3, wherein the wall has a concave portion for holding a connecting material for connecting the inner pipe.

5. The joint according to claim 1, wherein the connecting pipe has a connecting portion connected at an edge of the first opening and expanded outward in a radial direction of the first opening.

6. The joint according to claim 5, wherein the first opening is formed to be adjustable with respect to an attaching position of the connecting pipe to the first opening.

7. The joint according to claim 1, wherein the first connecting portion and the second connecting portion are formed in a flange type or union type.

8. The joint according to claim 7, wherein the first connecting portion of the flange type and the second connecting portion of the flange type are integrally formed with each other.

9. The joint according to claim 7, wherein the second connecting portion of the flange type has a through hole inserting a tightening structure, and the through hole is formed in a direction different from a direction where the inner pipe penetrates the wall.

10. A joint for a duplex pipe including an outer pipe for passing a first fluid, an inner pipe disposed inside of the outer pipe, the inner pipe for passing a second fluid, and a rib for connecting the outer pipe with the inner pipe, wherein the outer pipe is eliminated at an end portion to expose the inner pipe, the joint comprising:

a main body formed in a block shape, the main body disposed at the end portion of the outer pipe to cover the inner pipe exposed, the main body forming a passage for passing the first fluid flowing inside the outer pipe; the main body defining a first opening for supplying the first fluid from the passage to a first outer pipe, and a second opening for supplying the second fluid from the inner pipe to a second outer pipe;

wherein the inner pipe exposed from the end portion of

the outer pipe crosses the passage and elongates substantially in straight.

11. A joint for a duplex pipe including an outer pipe for passing a first fluid, an inner pipe disposed inside of the outer pipe, the inner pipe for passing a second fluid, and a rib for connecting the outer pipe with the inner pipe, wherein the outer pipe is eliminated at an end portion to expose the inner pipe, the joint comprising:

a main body formed in a block shape, the main body defining a first passage for passing the first fluid and a second passage for passing the second fluid, the main body defining a first opening for communicating the first passage with a first outer pipe guiding the first fluid, a second opening for communicating the second passage with a second outer pipe guiding the second fluid;

a first connecting portion connecting an end of the outer pipe with the first passage;

a second connecting portion connecting an end of the inner pipe with the second passage, the second connecting portion defining a concave portion;

a stopper for engaging the end of the outer pipe or the end of the inner pipe with at least one of the first connecting portion and the second connecting portion; and

a brazing material brazed in the concave portion of the

second connecting portion, the brazing material for brazing the end portion of the inner pipe to the second connecting portion.

12. The joint according to claim 11, wherein the concave portion has a tapered form in cross section to be smaller toward an end.

13. The joint according to claim 11, wherein a release mouth of the concave portion is turned upward when the end portion of the inner pipe is brazed to the second connecting portion, to temporarily support the brazing material and store the brazing material fused therein.

14. The joint according to claim 11, wherein the main body comprising: a first wall defining a blind hole in the first passage; and a second wall continuing to the first wall and defining a through hole communicating with the blind hole;

the first connecting portion is formed at the through hole; and

a blind plug is attached to a release end of the blind hole to close the release end.

15. The joint according to claim 11, wherein the main body comprising: a first wall defining a blind hole in the first

passage; and

the first connecting portion is formed at a release end of the blind hole.

16. A method of brazing a joint with a duplex pipe including an outer pipe for passing a first fluid, an inner pipe disposed inside of the outer pipe, the inner pipe for passing a second fluid, and a rib for connecting the outer pipe with the inner pipe, wherein the outer pipe is eliminated at an end portion to expose the inner pipe, the method comprising:

positioning the end portion of the inner pipe to the second connecting portion so that a brazing material is supported in a concave portion formed in the second connecting portion;

positioning the end portion of the outer pipe to the first connecting portion and disposing a brazing material to the first connecting portion;

disposing the main body to turn a release mouth of the concave portion upward;

heating the main body and the first connecting portion so as to fuse the brazing material placed in the concave portion and the brazing material placed to the first connecting portion; and

brazing the end portion of the outer pipe to the first connecting portion and the end portion of the inner pipe to the second connecting portion at the same time.

17. The method according to claim 16 further comprising: engaging the end portion of the outer pipe or the end portion of the inner pipe at the front end thereof with a stopper formed in at least one of the first and second connecting portion;

whereby the end portion of the inner pipe is positioned in the second connecting portion, and the end portion of the outer pipe is positioned in the first connecting portion.

18. The method according to claim 16 further comprising:

disposing a blind plug to close a release end of a blind hole bored in the main body for defining an inner passage;

disposing a brazing material to a third connecting portion between the release end and the blind plug; and

heating the third connecting portion to fuse the brazing material disposed at the third connecting portion to braze the blind plug to the third connecting portion.

19. The method according to claim 18, wherein the brazing step of the end portion of the outer pipe, the brazing step of the end portion of the inner pipe, and the brazing step of the blind plug are concurrently performed.

20. The method according to claim 18, wherein any one of the brazing step of the end portion of the outer pipe, the brazing step of the end portion of the inner pipe, and the brazing step of the blind plug is performed in advance.

21. The method according to claim 16, wherein the brazing steps include a pre-heating to heat the main body and a main-heating to heat the main body and the first connecting portion.

22. An air-conditioning apparatus for vehicle, the apparatus comprising:

a compressor for heating and pressurizing a gas coolant to high temperature and a high pressure;

a condenser for exchanging heat of the gas coolant with atmosphere to be a high pressure liquid coolant or gas-liquid mixture coolant;

a liquid tank for separating the high pressure liquid coolant or gas-liquid mixture coolant into gas and liquid;

an expansion valve for making a low temperature and low pressure liquid coolant or gas-liquid mixture coolant through adiabatic expansion;

an evaporator installed in a passenger's room of the vehicle, the evaporator for cooling air in the passenger's room by exchanging heat with the air of the passenger's room using



the low temperature and low pressure liquid coolant or gas-liquid mixture coolant to be returned to the compressor as the low pressure gas coolant;

a high pressure coolant pipe for carrying the coolant from the compressor to the evaporator through the condenser; and

a low pressure coolant pipe for carrying the coolant from the evaporator to the compressor,

wherein at least a part of one of the low pressure coolant pipe and high pressure coolant pipe is inserted into the other thereof or both pipes are arranged in parallel; and

a part of the low pressure coolant pipe is secured to the condenser.

23. The air-conditioning apparatus according to claim 22, wherein a part of the low pressure coolant pipe is formed integrally with a header pipe of the condenser.

24. The air-conditioning apparatus according to claim 22, wherein the liquid tank is directly mounted on a header pipe of the condenser.

25. The air-conditioning apparatus according to claim 22, wherein an anti-vibration member supports the condenser.